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SFIERE ONDLASKA JE 32013360 BIOASSAY REPORT GWM

ACUTE AND CHRONIC TOXICITY TESTS Conducted November 15 through 22, 1994

Prepared for Onalaska Landfill Groundwater Treatment Facility Onalaska, Wisconsin

Prepared by

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Summary

CH2M HILL conducted acute and chronic toxicity tests on effluent samples provided by the Onalaska Landfill Groundwater Treatment Facility (LGTF), Onalaska, Wisconsin. The bioassays were conducted from November 15 through 22, 1994, as part of compliance biomonitoring for the State of Wisconsin. *Ceriodaphnia dubia, Daphnia magna*, and fathead minnows were used as the test organisms. The following is a summary of the test results:

Acute Toxicity

Test Media	Ceriodaphnia dubia	Daphnia magna	Fathead Minnow
Black River Control 100% Effluent	Pass Pass	Pass Pass	Pass Pass
Laboratory Control	Pass	Pass	Pass

Chronic Toxicity

	Ceriodaphnia dubia		Fathead Minnow	
Test Media	Mean % Survival	Mean No. of Offspring	Mean % Survival	Mean Growth (mg)
Black River Control	100	31.2	85	0.457
3.7% Effluent (IWC)	100	35.1	87.5	0.531
5% Effluent	100	32.0	87.2	0.419
10% Effluent	100	31.9	92.5	0.454
20% Effluent	100	33.1	79.7	0.471
40% Effluent	100	30.4	92.5	0.435
80% Effluent	100	28.4	97.5	0.492
IC ₂₅		80%		> 80%
Laboratory Control	100	33.1	89.7	0.404
37% IWC (diluted with laboratory water)	100	30.1	92	0.449

For NPDES compliance purposes, the test results show that:

- The effluent samples were not acutely toxic to *Ceriodaphnia dubia*, *Daphnia magna*, or fathead minnows at 100 percent concentrations using the 50 percent lethality criteria.
- The effluent samples were not chronically toxic to either *Ceriodaphnia dubia* or fathead minnows at the 3.7 percent IWC. The concentration of effluent that was estimated to be chronically toxic to both test organisms, based on the IC₂₅ analysis, was greater than 80 percent.
- Black River and laboratory water data met test acceptability criteria in all acute and chronic bioassays.

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Introduction

This report presents the results of the laboratory acute and chronic toxicity tests conducted by CH2M HILL on effluent samples provided by the Onalaska LGTF, Onalaska, Wisconsin. The bioassays used *Ceriodaphnia dubia*, *Daphnia magna*, and fathead minnows as the test organisms and were performed from November 15 through 22, 1994, as part of compliance biomonitoring for the State of Wisconsin.

Methods

All laboratory methods, including organism culture, sample handling, test procedures, and data analyses, were in accordance with the recommendations of the U.S. Environmental Protection Agency (EPA) [1, 2, 3, 4], the CH2M HILL Milwaukee Bioassay Laboratory's Standard Operating Procedures, and the Wisconsin Department of Natural Resources (DNR) biomonitoring requirements.

Sample Collection and Handling

Photocopies of the chain-of-custody forms are included in Appendix B. Three 24-hour composite effluent samples and one receiving water grab sample were used as follows:

Description	Sample No.	Date Collected	Date Tested
Black River	545.01	11/15	11/15-22
Stripping Tower Effluent	545.02	11/13-14	11/15-18
Stripping Tower Effluent	545.03	11/16–17	11/18-20
Stripping Tower Effluent	545.04	11/17–18	11/20-22

All samples were collected by Onalaska LGTF personnel and shipped or delivered on ice to the CH2M HILL Milwaukee Bioassay Laboratory. Upon arrival, samples were logged in and physicochemical characterizations were conducted. Samples not immediately prepared for testing were refrigerated (4°C) for later use.

Test Organisms

All test organisms were cultured at the CH2M HILL Milwaukee Bioassay Laboratory.

Test Procedures

Bioassays

Bioassay test conditions are summarized in Tables 1 through 5.

Table 1 Summary of Test Conditions for the Ceriodaphnia Acute Bioassay Conducted for the Onalaska LGTF Onalaska, Wisconsin November 15 through 17, 1994

1.	Test organism	Ceriodaphnia dubia (Crustacea:	Cladocera).
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2. Test type Static renewal.

3. Age of test organisms Less than 24 hours.

4. Test chamber size 30 mL

5. Test solution volume 25 mL

Renewal of test solutions Daily.

7. Replicate chambers per treatment 4

6.

3. Test organisms per chamber 5

Primary control/dilution water Receiving water: Black River.

10. Internal control water Laboratory culture medium.

11. Effluent concentrations 6.25, 12.5, 25, 50, and 100%

12. Temperature 20 ± 1 °C

14. Aeration None.

15. Test duration 48 hours.

16. Sampling scheme One 24-hour composite effluent sample. Maximum

None.

holding time of 48 hours between completion of collection and initial test use. One receiving water grab sample collected within 48 hours of test initiation.

Laboratory water used was collected daily.

17. Effects measured Survival.

18. Test acceptability 90% or greater mean survival in the laboratory or

receiving water control.

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13. Feeding regime

Table 2 Summary of Test Conditions for the Daphnia Acute Bioassay Conducted for the Onalaska LGTF Onalaska, Wisconsin November 15 through 17, 1994

1.	Test organism	Daphnia magna (Crustacea: Cladocera).
2.	Test type	Static renewal.
3.	Age of test organisms	Less than 24 hours.
4.	Test chamber size	30 mL
5.	Test solution volume	25 mL
6.	Renewal of test solutions	Daily.
7.	Replicate chambers per treatment	4
8.	Test organisms per chamber	5
9.	Primary control/dilution water	Receiving water: Black River.
10.	Internal control water	Laboratory culture medium.
11.	Effluent concentrations	6.25, 12.5, 25, 50, and 100%
12.	Temperature	20 ± 1°C
13.	Feeding regime	None.
14.	Aeration	None.
15.	Test duration	48 hours.
16.	Sampling scheme	One 24-hour composite effluent sample. Maximum holding time of 48 hours between completion of

17. Effects measured

Survival.

18. Test acceptability

90% or greater mean survival in the laboratory or

collection and initial test use. One receiving water grab sample collected within 48 hours of test initiation.

Laboratory water used was collected daily.

receiving water control.

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Table 3 Summary of Test Conditions for the Fathead Minnow Acute Bioassay Conducted for the Onalaska LGTF Onalaska, Wisconsin

November 15 through 19, 1994

1. Test organism	Pimephales promelas (Osteichthyes:	Cyprinidae).
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Static renewal. Test type

Age of test organisms 31 days old.

500 mL Test chamber size

400 mL Test solution volume

Renewal of test solutions Daily.

7. Number of replicate chambers per treatment

2

8. Number of test organisms per chamber 10

Primary control/dilution water Receiving water: Black River.

10. Internal control water Laboratory culture medium.

11. Effluent concentrations 6.25, 12.5, 25, 50, and 100%

 20 ± 1 °C 12. Temperature

None. 13. Feeding regime

None, unless DO concentration falls below 40% 14. Aeration

saturation (then, continuous at rate not exceeding

100 bubbles/minute).

15. Test duration 96 hours.

16. Loading rate Less than 0.65 g/L.

Two separate 24-hour composite effluent samples, each 17. Sampling scheme

> used for a 48-hour exposure. Maximum holding time of 48 hours between completion of collection and initial

test use for each sample. One grab sample of receiving water collected within 48 hours of test initiation. Laboratory water used was collected daily.

18. Effects measured Survival.

90% or greater mean survival in the laboratory or 19. Test acceptability

receiving water control.

Table 4 Summary of Test Conditions for the Ceriodaphnia Chronic Bioassay Conducted for the Onalaska LGTF Onalaska, Wisconsin November 15 through 21, 1994

Test organism Ceriodaphnia dubia (Crustacea: Cladocera).
 Test type Static renewal.

3. Age of test organisms

Less than 24 hours, all released within an 8-hour period (same generation from even-aged parents).

4. Test chamber size 30 mL

5. Test solution volume 15 mL

6. Renewal of test solutions Daily.

7. Number of replicate chambers per treatment 10

8. Number of test organisms per chamber 1

. Primary control/dilution water Receiving water: Black River.

10. Secondary control water Laboratory culture medium.

11. Effluent concentrations 3.7, 5, 10, 20, 40, and 80%; and an additional 3.7%

using laboratory water for dilution.

12. Temperature 25 ± 1 °C

13. Feeding regime 0.1 mL each of YCT culture food and algae per test

chamber daily.

14. Aeration None.

15. Test duration 6 days. (Controls had 3 broods.)

16. Sampling scheme Three 24-hour composite effluent samples, each used

for a minimum of 48 consecutive exposure hours. Maximum holding time of 48 hours between completion of collection and initial test use of each sample. One grab sample of receiving water collected within 48 hours of test initiation. Laboratory water

used was collected as one batch.

17. Effects measured Survival and reproduction.

18. Test acceptability Laboratory or receiving water control with 80% or

greater mean survival, an average of 15 or more young per surviving female, and at least 60% producing three

broods.

Table 5 Summary of Test Conditions for the Fathead Minnow Chronic Bioassay Conducted for the Onalaska LGTF Onalaska, Wisconsin November 15 through 22, 1994

1.	Test organism	Pimephales promelas (Osteichthyes: Cyprinidae).
2.	Test type	Static renewal.
3.	Age of test organisms	Larval, less than 24 hours.
4.	Test chamber size	500 mL
5.	Test solution volume	300 mL
6.	Renewal of test solutions	Daily.
7.	Number of replicate chambers per treatment	4
8.	Number of test organisms per chamber	10
9.	Primary control/dilution water	Receiving water: Black River.
10.	Secondary control water	Laboratory culture medium.
11.	Effluent concentrations	3.7, 5, 10, 20, 40, and 80%; and an additional 3.7% using laboratory water for dilution.
12.	Temperature	25 ± 1°C
13.	Feeding regime	0.15 mL brine shrimp nauplii (less than 24 hours old) twice daily.
14.	Aeration	None, unless DO concentration falls below 40% saturation (then, continuous at rate not exceeding 100 bubbles/min).
15.	Cleaning	Siphon daily, immediately before test solution renewal.
16.	Test duration	7 days.
17.	Sampling scheme	Three 24-hour composite effluent samples, each used for a minimum of 48 consecutive exposure hours. Maximum holding time of 48 hours between completion of collection and initial test use of each sample. One grab sample of receiving water collected within 48 hours of test initiation. Laboratory water used was collected daily.
18.	Effects measured	Survival and growth (biomass).
		• •

Laboratory or receiving water control with 80% or greater mean survival, and surviving fish with at least

0.25 mg average dry weight.

19. Test acceptability

Physicochemical Monitoring

Total alkalinity, hardness, and total ammonia were measured initially on each new sample. Total residual chlorine was measured initially on each effluent sample. Total alkalinity and hardness were measured once in the laboratory control media.

Dissolved oxygen (DO), pH, and conductivity were measured initially and daily thereafter in all test treatment renewals. DO and pH were measured in one test chamber or composite of each 24-hour-old test solution.

Bioassay incubator temperature was electronically monitored hourly by thermocouple and data logger, and a 24-hour summary of mean values was recorded.

Data Analysis

Pass/fail criteria were applied to acute toxicity data. A modified EPA mathematical analysis was used to estimate an IC_{25} (the concentration that is inhibited 25 percent from the control data) on chronic toxicity data. The IC_{25} value generated is the linear interpolation estimate.

Toxicity was defined according to the following DNR criteria:

Acute Toxicity

• Less than 50 percent survival of test organisms in 100 percent effluent at test termination (48 hours for *Ceriodaphnia dubia* and *Daphnia magna*, and 96 hours for fathead minnow).

Chronic Toxicity

• IC₂₅ value for *Ceriodaphnia dubia* reproduction or fathead minnow biomass less than the 3.7 percent instream wastewater concentration (IWC) after a nominal 7-day exposure.

Quality Assurance

Part of the quality assurance and quality control (QA/QC) program at the CH2M HILL Milwaukee Bioassay Laboratory includes the performance of organisms concurrently tested in laboratory media. Tables 1 through 5 present the test acceptability criteria for laboratory control data. The results of the laboratory control tests are listed in Tables 6 and 7.

In addition, other QA/QC procedures include performing monthly reference toxicant tests using reagent-grade sodium chloride. The results of reference toxicant tests conducted

during the past 12 months on the appropriate test organisms are summarized in Appendix C.

Results

Photocopies of the laboratory data and computer printouts of the statistical analyses are found in Appendix A. There were no excursions from the protocols and all test conditions were within the limits required by the EPA and the DNR. The test results are summarized below.

Acute Bioassays

Table 6 presents the acute bioassay results. No acute toxicity was demonstrated to *Ceriodaphnia dubia, Daphnia magna*, or fathead minnows in the 100 percent effluent concentration. Black River and laboratory control data were acceptable in all tests.

Table 6
Summary of Results of Acute Bioassays
Conducted for the Onalaska LGTF
Onalaska, Wisconsin
November 15 through 19, 1994

	Mean Percent Survival				
Test Media	Ceriodaphnia dubia	Daphnia magna	Fathead Minnow		
Black River Control	100	100	100		
6.25% Effluent	100	100	100		
12.5% Effluent	100	100	100		
25% Effluent	100	100	100		
50% Effluent	100	100	100		
100% Effluent	100	100	100		
Laboratory Control	100	100	100		

Chronic Bioassays

Table 7 presents the chronic bioassay results. No chronic toxicity was indicated to *Ceriodaphnia dubia* or fathead minnows at the 3.7 percent IWC using the IC_{25} criteria. The IC_{25} values for both reproduction and growth were greater than 80 percent.

Table 7
Summary of Results of Chronic Bioassays
Conducted for the Onalaska LGTF
Onalaska, Wisconsin
November 15 through 22, 1994

	Ceriodaphnia dubia		Fathe	ead Minnow
Test Media	Mean % Survival	Mean No. of Offspring	Mean % Survival	Mean Growth (mg)
Black River Control	100	31.2	85	0.457
3.7% Effluent (IWC)	100	35.1	87.5	0.531
5% Effluent	100	32.0	87.2	0.419
10% Effluent	100	31.9	92.5	0.454
20% Effluent	100	33.1	79.7	0.471
40% Effluent	100	30.4	92.5	0.435
80% Effluent	100	28.4	97.5	0.492
IC ₂₅		80%		> 80%
Laboratory Control	100	33.1	89.7	0.404
37% IWC (diluted with laboratory water)	100	30.1	92	0.449

Physicochemical Data

All physicochemical parameters measured satisfied the bioassay requirements (see Appendix A).

Conclusions

The results of the laboratory bioassays conducted on effluent samples collected by the Onalaska LGTF on November 14, 17, and 18, 1994, show:

- The effluent samples were not acutely toxic to *Ceriodaphnia dubia*, *Daphnia magna*, or fathead minnows at 100 percent concentrations using the 50 percent lethality criteria.
- The effluent samples were not chronically toxic to either *Ceriodaphnia dubia* or fathead minnows at the 3.7 percent IWC. The concentration of effluent that was estimated to be chronically toxic to both test organisms, based on the IC₂₅ analysis, was greater than 80 percent.
- Black River and laboratory water data met test acceptability criteria in all acute and chronic bioassays.

References

- 1. Weber, C. I. (ed.). 1993. Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms (Fourth Edition). EPA/600/4-90/027F. U.S. EPA, Environmental Monitoring and Support Laboratory, Cincinnati, Ohio. 293 p.
- 2. Denny, J. S. 1987. Guidelines for the Culture of Fathead Minnows, Pimephales promelas, for Use in Toxicity Tests. EPA/600/3-87/001. U.S. EPA, Environmental Research Laboratory, Duluth, Minnesota. 42 p.
- 3. Weber, C. I., et al. 1989. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (Second Edition). EPA/600/4-89/001. U.S. EPA, Environmental Monitoring Systems Laboratory, Cincinnati, Ohio. 249 p.
- 4. Weber, C. I., et al. 1989. Supplement to Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (Revision 1). EPA/600/4-89/001a. U.S. EPA, Environmental Monitoring Systems Laboratory, Cincinnati, Ohio. 42 p.

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APPENDIX A
LABORATORY DATA SHEETS
AND STATISTICAL ANALYSES

48-HOUR ACUTE TEST INITIAL CHEMICAL DATA*

(1-7 TREATMENTS)

PROJECT No.: <i>TSE 142.32</i>	CLIENT: _O	NALASKA	CANDFICE
TEST ORGANISM: Ceriodaphnia	dubia	LAB MEDIA /No.:	CULTURE MEDIA
SAMPLE No.(s): 545-01, 02, 23, SAMPLE DESCRIPTION: EFFLUE	042	CONTROL/DILUEN	IT: BLACK RIVER
SAMPLE DESCRIPTION: EFFLUE	NT		
TEST START DATE: //-/6-94 TIME	1000	TEST END DATE:	11-18-94 TIME: 1030
ANALYST(s): Stark, Tramme		COI	

INITIAL CHEMICAL MEASUREMENT

TREAT.	TEST SOLN	PARAMETER	EXPOSURE I	PERIOD (HR) 24	COMMENTS	
1	LAB	DO pH COND	8.9 8.6 0.19	8.5 8.2 0.17		
2	BLACK RIVER	DO pH COND	8.8 7.9 0,18	8.5 8,1 0,18		
3	6.25%	DO pH COND	9.2 7.9 0.20	8.9-2 5t 8.6 0.20		
4	12.5%	DO pH COND	9, 2 2, 9 0, 2 1	9.2 8.0 0.21	e.	
5	25 %	DO pH COND	9.3 7.9 0.25	9.3 8.0 0.24		;
6	50%.	DO pH COND	9.4 8.6 0.31	9, 4 8, 1 0, 29		
7	100 %	DO pH COND	9.3 8.1 0.42	9.3 8.1 0.39		
	DATE SAMPLE No. DETERMINED) BY	1/-16 .02 J5	11-17 .02 JZ		

*DO as mg/L COND as mmho

48-HOUR ACUTE TEST FINAL CHEMICAL DATA*

(1-7 TREATMENTS)

PROJECT No.: 15E 142.3 2 CLIENT:	Onalaska Landfill
TEST ORGANISM: Ceriodaphina durica	LAB MEDIA /No.: Calture media
	CONTROLIDILUENT: Black RIVA
SAMPLE No.(s): 545.01, .62 SAMPLE DESCRIPTION: Effluet	
TEST START DATE: /1-/6-94 TIME: 1800	TEST END DATE: 11-18-94 TIME: 1030
ANALYST(s): Trammel	CODE:

FINAL MEASUREMENT

TREAT.	TEST SOLN	PARAMETER	EXPOSURE I	PERIOD (HRS)	COMMENTS
1	LAB	DO pH	8.4 8./	8.4	
2	Black River	DO pH	8. 4 8.1	8.5 8.0	
3	6.26%	DO pH	8.5 8.0	8.6	
4	12.5%	DO pH	8.6	8.7	
5	25%	DO pH	8.7	8.7	· .
6	50%	DO pH	8.7 8.2	8.7	
7	100%	DO pH	8.3	8.7	
•	DATE DETERMINED) BY	11-17	11-18	

*DO as mg/L COND as mmho

48-HOUR ACUTE BIOASSAY SURVIVAL DATA

(4 Reps. 1-7 Treatments)

SAMPLE I SAMPLE I LAB MEDI TEST STA	PROJECT No.: TEC 14732 CLIENT: Onalaska Land S: 11 TEST ORGANISM: Cerioda pania dubia AGE: 244 LOT No.: 578 SAMPLE DESCRIPTION: Effluent SAMPLE No.(s): 545.01, 545.02 LAB MEDIA/No.: Cafture pudia CONTROL/DILUENT: Black Pium TEST START DATE: 11-16-94 TIME: 1000 TEST END DATE: 11-18-94 TIME: 1030 ANALYST(s): J- Trammul CODE:						
TREAT. NO.	TEST SOLN	REP		LITIES POSURE D (Hrs) 48	TOTAL FATAL.	MEAN SURV.	COMMENTS
1	LAB	A B C	0000	<i>O O O</i>	0 0 0	100%	
2	Black River	A B C D	0 0 0	0 0 0 0	0 0	100 %	
3	6.25%	A B C D	0 0 0	0 0 0	0 0	100%	
4	12.5%	A B C D	0 0	0 0 0	0 0 0	100%	
5	25%	A B C D	0 0	0000	0 0	100%	•
6	50%	A B C D	0 0 0	0000	0 0 0	100 %	
7	1007	A B C D	0 0 0	0 0	0000	100%	
Constitution of the Consti	DATE DETERMINED	ВҮ	11-17	11-17 JE			

48-HOUR ACUTE TEST INITIAL CHEMICAL DATA*

(1-7 TREATMENTS)

PROJECT No.: 75€ 142.32 CLIENT:	Onalaska Landfill
TEST ORGANISM: Dephare magne	LAB MEDIA /No.: Cylture media
SAMPLE No.(s): 545.61, .02	CONTROLIDILUENT: Black RIVE
SAMPLE DESCRIPTION: Est/went	
TEST START DATE: 11-16-94 TIME: 1015	TEST END DATE: 1-18-94 TIME: 1040
ANALYST(s): J. Trammel	CODE:

INITIAL CHEMICAL MEASUREMENT

TREAT.	TEST		EXPOSURE PERIOD (HR)		
NO.	SOLN	PARAMETER	0	24	COMMENTS
1	LAB	DO pH COND	8.9	8.5 8.2 0.17	
2	Black River	DO pH COND	8.8 7.9 0.18	8.5 8.1 ø.18	
3	6.25%	DO pH COND	9.2 7.9 0.20	8.9 8.0 0.26	
4	12.5%	DO pH COND	9,2 7,1 0,21	9.2 8.6 0.21	c
5	25%	DO pH COND	9.3 7.9 0.25	9.3 8.0 0.24	
6	50%	DO pH COND	9.4 9.0 0.3/	9.9 8.1 0.29	
7	100%	DO pH COND	9.3 8.1 0.42	9.3 8.1 0.39	
	DATE SAMPLE No. DETERMINED) BY	1/+16 · 55 ·	11-17 5E	

*DO as mg/L COND as mmho

48-HOUR ACUTE TEST FINAL CHEMICAL DATA*

(1-7 TREATMENTS)

PROJECT No.: 15E 142.3 2 CLIENT:	Onalaska Landfill
TEST ORGANISM: Daphnia magna	LAB MEDIA /No.: Calture media
SAMPLE No.(s): 545.01, .02	CONTROLIDILUENT: Black RIVE
SAMPLE DESCRIPTION: Effluent	
TEST START DATE: 11-16-94 TIME: 1015	TEST END DATE: 11-18-74 TIME: 1040
ANALYST(s): J. Trammel	CODE:

FINAL MEASUREMENT

TREAT, NO.	TEST SOLN	PARAMETER	EXPOSURE F 24	PERIOD (HRS) 48		COMMENTS	
1	LAB	DO pH	8.4 8.0	8.8 7.9			
2	Black River	DO pH	8.4	8.7 7.9			
3	6.26%	DO pH	8.4 8.0	8.7 7.9			
.4	12.5%	DO pH	8.4 8.0	8.7	c		
5	25%	DO pH	8.4 8./	8.7			
6	50%	DO pH	8.4 8.2	8.7			·.
7	100%	DO pH	8. <i>4</i> 8. 3	8.6 8.1			
	DATE DETERMINED) BY	11-17 TT	11-18			

*DO as mg/L COND as mmho

48-HOUR ACUTE BIOASSAY SURVIVAL DATA

(4 Reps. 1-7 Treatments)

TEST OR SAMPLE	DESCRIPTION:_ No.(s): 545.0	PHNIA E. 1. oz	Mag.	<i>h</i> 4	AGE:	. 244	LOT No.:362
TEST STA	IA/No.: <u>Cultur</u> ART DATE: <u>11-1</u> (s): <u>J. Tran</u>	6-94	7:2 TIME: <u>/0</u>				: Black RIVE: 1040
TREAT. NO.	TEST SOLN	REP	PER EX	LITIES POSURE D (Hrs) 48	TOTAL FATAL.	MEAN SURV.	COMMENTS
1	LAB	A B C D	0 0 0	0 0	0 0	100%	* 4B-0814 4 BUGS SET. JE
2	Black River	A B C D	0 0 0	0000	0 0 0	100%	
3	6.25%	A B C D	0 0 0	0 0 0	0 0 0	100%	
-4	12.5%	A B C D	0 0* 0	0 0 0	0 0	100%	· .
5	25%	A B C D	0 0 0	0 0 0	0 0 0	100%	-
6	50%	A B C D	0 0 0	0 0 0	0 0	100%	
		Α	0	0	0		

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100%

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0

96-HOUR ACUTE TEST INITIAL CHEMICAL DATA*

(1-7 TREATMENTS)

PROJECT No.: TSE 14232 CLIENT: Onalgska Landfill
TEST ORGANISM: Fother minnon LAB MEDIA /No.: Cu Hure media
SAMPLE No.(s): 545.01.02,03 CONTROL/DILUENT: Black RIVESAMPLE DESCRIPTION: Effluent
SAMPLE DESCRIPTION: Efflunt
TEST START DATE: 1/-/6-94 TIME: 1030 TEST END DATE: 1/-20-94 TIME: 1/00
ANALYST(s): J. Trammel CODE:

INITIAL CHEMICAL MEASUREMENT

TREAT.	TEST		EX	POSURE	PERIOD (H	RS)	40 ·
NO.	SOLN	PARAMETER	0	24	48	72	COMMENTS
	LAB	DO pH COND	8.8 7.9 0.18	8.5 8.0 0.18	8.5 7.9 0.17	8.9 7.6 0.20	
2	Black	DO pH COND	8.8 7.9 .18	8.9 8.(.18	8.5 7.8 0.18	9.0 7.7 0.18	
3	6.25%	DO pH COND	9.2 7.9 .20	8.9 8.0 .20	9.1 7.8 0.19	9.2 7.6 0.20	
4	12.5%	DO pH COND	9.2 7.9 ·21	9.2 8.0.	9.2 7.8 0.21	9,4 7.8 0.22	·
5	25%	DO pH COND	9.3 7.9 .25.	9.3 8.0 .24	9.2 7.8 0.22	9,4 7.8 0.24	·
6	50%	DO pH COND	9.3	9.3 8.1 .29	9.3 7.9 0.30	9.5 7.9 0.29	
7	1007.	DO pH COND	9.3 8.1 .42	9.3 8.1 .39	9.3 7.9 0.40	9.6 8.0 0.39	
	DATE SAMPLE NO	O.	11-16	11-17	.03	1/-19	

JU

JZ

DETERMINED BY

*DO as mg/L COND as mmho

96-HOUR ACUTE TEST FINAL CHEMICAL DATA*

(1-7 TREATMENTS)

PROJECT No.: TSE 142.32 CLIENT:	Onalaska Landfill
TEST ORGANISM: Fatherd minnon	LAB MEDIA /No.: Calture media
SAMPLE No.(s):545.01, .02, .03	CONTROL/DILUENT: Black River
SAMPLE DESCRIPTION: Efflunt	
TEST START DATE: 11-16-94 TIME: 1030	TEST END DATE: 11-20-94 TIME: 1100
ANALYST(s): J. Trammel	CODE:

FINAL MEASUREMENT

TREAT.	TEST			IRE PERIO		ı	
NO.	SOLN	PARAMETER	24	48	72	96	COMMENTS
		DO	7,1	7.6	8.6	8.5	
1 .	LAB	рН	8.6	7.8	8.0	2.6	
	Black	DO	74	7.7	8.0	8.3	
2	Black	рН	7.9	7.8	7.9	7.6	
•	/ 25	DO	7.5	7.8	8.1	8.3	
3	6.25%	рН	7.9	7.7	7.8	7.6	
		DO	7.6	7.9	8.0	8.3	
4	125%	∴pH	7.8	7.7	7.8	2.6	
		DO	2.2	8.1	8.1	8.3	
5	25%	рН	7.9	7.7	7.8	7.7	· !
		DO	2.7	8.1	8.0	8.4	
6	50%	. рН	7.9	7.8	7.8	7.8	;
	1.0	DO	7.7	8.2	7.2	8.2	
7	100%	рН	7.9	7.8	7.9	7.8	
and the second	DATE		11-17	11-18	11-19	11-20	
	DETERMINED	BY	56	5%	17	10%	

96-HOUR ACUTE BIOASSAY SURVIVAL DATA

(1 – 7 Treatments)

PROJECT No.: TSE 14232 CLIENT: Onalask	a Landfill
TEST ORGANISM: Fathers minnor	AGE: 90 3/ 1) LOT No.: 1559
SAMPLE DESCRIPTION: Efflunt	
SAMPLE No.(s): 545.01, .02, .03	
LAB MEDIA/No.: Calture mudia	CONTROLIDILUENT: Black Rive
TEST START DATE: 11-16-94 TIME: # 20-94	TEST END DATE: 11-20 94 TIME: 1100
ANALYST(s): J. Tramme 1030	CODE:

TREAT. NO.	TEST SOLN	REP	.24	FATALI PER EXPO PERIOD 48	SURE	96	TOTAL FATALITIES	MEAN SURVIVAL
1	LAB	В	0	0	0	0	0	100%
2	Bleck	A B	0	0	0	0	0	100%
3	6.25%	A B	· 0	0	0	0	0	100%
4	12:5%	A B	0	0	0	0	0	100%
5	25%	A B	0	0	6	0	0	100%
6	50%	A B	0	0	0	0	0	100%
7	100%	A B	0	0	0	0	0	100%
	DATE DETERMINED BY	,	11-17 5 C	11-18	11-19	11-20		

COMMENTS:

CHRONIC TEST INITIAL CHEMICAL DATA*

PROJECT No.: 73E 142.32 CLIENT: Onalaska Landfill

TEST ORGANISM: Certodophnia dubla LAB MEDIA /No.: Calture mudia / 545.CCL

SAMPLE No.(s): 545.01, .02, .03, .04 CONTROL/DILUENT: Black River

SAMPLE DESCRIPTION: Effluent

TEST START DATE: 11-16-94 TIME: 1200 TEST END DATE: 11-22-94 TIME: 1/30

ANALYST(s): Stark, Cookle, Trammel CODE:

TREAT	TEST		1			SURE	YAC			
ИО.	SOLN	PARAMETER	0	1	2,	3	4	5	6	-COMMENTS
1	Lab	DO pH COND	8.3	8.2 78 .20	8.2 7.9	8.3 7.9 .20	8.1 7.9 .20	8,1 7,9 0.20	8.2 7.9 0.18	
2	River	DO pH COND	8.4 8.0 .20	8.1 7.9	8.29 8.0 ,19	68. 5 7.8 19	8.4 7.8 .19	7.9 7.9 .19	8.2 8.0 0.19	
3	3,7%	DO pH GOND	8.4 7.9 -21	8.2 7.9 .20	7.9	8.4 7.9 .21	8.4 7.8 .20	7.9 7.8 .20	8.1 8.0 0.21	
A	5 %	DO pH COND	8.4 7. 9 .2/	8.1 7.9	8.0 80 .22	8.3 7.9 .21	8,4 7.8 .20	8.0 ≠7.8 •21	8.1 8.1 0.21	
5	10%	DO pH GOND	8.5	8,1 7,9 ,21	811	8.0	8.4 7.8 .22	8.0 7.8 .22	8. / 8.*/ 0.22	,
6	20%	:©DO pH COND	8.5 7.9 .25	8.1 7.9 .24	811	8.0	7.9	7.9 7.8 · 25	8./ 8./ 0.25	
7 :	40%	DO pH COND	8.5 7.9 .29	7.9	80	8.0	8.4	8.0 7.9 .29	8.2 8.2 0.28	
	DATE SAMPLE No.	*	11-16	1-17	11-19	11-19	11-20		11-22	

^{*}DO = DISSOLVED OXYGEN (mg/L)

DETERMINED BY

COND = CONDUCTIVITY (mmho)

CHRONIC TEST FINAL CHEMICAL DATA*

PROJECT No.: 75E 142.32 CLIENT: Onglaska Landfill

TEST ORGANISM: Certodaphna dubia LAB MEDIA No.: Culture mudia / 545.CCL

SAMPLE No.(s): 545.01, .02, .03, .04 CONTROLIDILUENT: Black RIVEN

SAMPLE DESCRIPTION: Effluent

TEST START DATE: 11-16-94 TIME: 1200 TEST END DATE: 11-22-94 TIME: 1130

ANALYST(s): Stark, Cookle, Trammul CODE:

TREAT	TEST	PARA-			EXPOSt	JREDAY			
NO.	SOLN	METER	1	2	3	4	5	6	7
1	Lab	DO	7.7	8,/	8.2	8.3	8.4	8.2	
	245	pН	8.2	8.1	8.0	7.9	8.0	8.0	
2	River	DO	7.8	811	8. [8.2	8.4	8.2	
	Kiver	pН	8.2	8-1	7.9	8.0	7.9	8.0	
3	27./	DO	8.0	8.(8.2	8.2	8.4	8,2	
	3.7 %	pН	8.2	80	7.9	7.9	7.5	8.0	
4	- 11	DO	8.0	8.1	8.2	9.1	8.3	8.2	
	5 '%	pН	8.2	8,0	7.9	7.9	8,0	8.0	
5		DO	8.1	8.1	8.1	8.2	8.3	8,2	
	10 %	pН	8,2	ह.।	7.9	7.9	82	8.1	
6	, ,	DO	8.1	8.1	8.2	8.1	8,2	8,2	
	20 %.	рН	8.2	811	7.9	7.9	8.0	8,1	
7	40%	DO	8,1	8.1	8,1	8.2	8,2	8.2	
	70',	рН	8.2	8.2	7.9	7.9	80	8.1	•
	DATE		11-17	11-18	11-19	11-20	11-21	11-22	
	DETERMINED E	*DO = Dissol	<u>ت</u>	M 60015	JS Conduction	<u>J</u> S	a	Ja .	

*DO = Dissolved Oxygen (mg/L) COND = Conductivity (mmho)

COMMENTS:

PROJE	CT No.: 73	E 14	2-32		CLIE	NT:	Ona	laska	La	md fr	11		•					
	DRGANISM:									AGE:	_ < 2	Yhr.		LOT No.:	578			
	E DESCRIP																	
	E No.(s): <u>5</u>					24												
	EDIA/No.:_<						CL				CON	TROLIC	DILUENT: B	ack River wa	ater			
	TART DATE													2-94		30		
	ST(s): <u>senu</u> t								CODE	Ξ:					PAGE		5	
TREAT.	TEST	1000			Cosa y Alba	OFFS	PRING F	PER RE	PLICATI	E. J. A.,		tan Palas				- 44 ella		
NO.	SOLN	DAY	1	2	3	4	5	6	7	~	9	10		COM	MENTS			
		1	OK					ļ	-			>					***************************************	
		2	6K			-			-			→	,					
1	1 .1-	3	8	5	5	7	6	5	3	5	6	5] .					
[Lab	4	G		-			->	111	6		>						
		5	18	11	10	10	12	13	6	12	1.3	//						
		6	18	15	17	15	14	177	15	18	16	16						
		7																
				-										JMARY				
NO. of Y	(0) (1) (0		158	157	T = =	7 3 2	1 5 5	136	1.26	156	T = =	133	TOTAL	MEAN				
NO. of B		<u></u>	38	3(32	32	32	35	29	35	35	32	33/ 35	33.1				
	FATALMES		3	0	0	0	0	0	5	3	3	0	0	% SURVIVAL	100	\neg		
TREAT.	TEST						PRING F								<u> </u>	X		
NO.	SOLN	DAY	1	2	3	4	5	6	7	8	9	10		COMN	IENTS			
	Black River	1	OK									>						
ĺ	Diuen	2	OK.									->						ļ
\neg	River	3	5	6	4	4	5	3	7	5	0	7						
2	70100	4	G	lo	4-					7	6	G						
		5	11	G	11	9	13	11	12	10	14	12						
		6	16	14	14	16	15	14	14	12	18	14						
		7		<u> </u>			<u> </u>								•			
													SUM TOTAL	MEAN				
NO. of Y	OUNG		32	30	29	29	3,3	28	33	27	38	33	312	31.2				
NO. of B			3	3	3	3	3	3	3	3	3	3	30	3				
	ATALITIES		0	Ó	0	0	0	ی	0	0	0	0	0	% SURVIVAL	100			
EXPOSU	RE DAY		0	1	2	3	4	5	6	7		- <u></u>						
DATE			11-16	11-17	11-18	11-19.	11-20	11-21	11-22									
DETERM	INED / FED BY	/	32	J 5	IS		٦٢	ge	ax									

PROJE	CT No.: 75	5E 1	423	۷	CLIE	NT:	Ona	laska	(and.	5,11		•					
TEST C	PRGANISM:		ciod	نمطهه	a du	bia				AGE	_ 42	-Yhc.		LOT No.:	578			
	E DESCRIP																	
	E No.(s):_ 5																	
	EDIA/No.:_<									and the same of th				ick River wa				
	TART DATE				: <u>/</u> 250	٥					TEST	END	DATE: <u>//-2</u>	2-94				
ANALY	ST(s): <u>3444</u> 3	(, C	okl	<u> </u>					_ COD	E:					PAGE_2	OF	<u> </u>	
TREAT.	TEST				W 2.				PLICATI		<u> </u>						300	*
NO.	SOLN	DAY	11_	2	3	4	5	6	7	8	9	10		COMM	ENTS		<u> </u>	
		1	OK			 		-		+	 	<u> </u>						
		5	OK	1		5	8	7	6	5		17						
3	3.7%	3	6	6	6	14		1	6	3	6	6						
		5	10	15	13	G	/5	12	10	11	14	11						
		6	16	15	18	19	15	18	16	177	18	13						
		7	10	1	1,0	 	<i>'</i>	10	10	/	10	1,						
1		<u> </u>	ــــــــــــــــــــــــــــــــــــــ			1		I	J	.l	J	-l	SUM	MARY				
	<u> </u>							·		:: <u>.</u>			TOTAL	MEAN				
NO. of Y			32	36	37	38	38	37	32	3.3	38	30	351	35.1				
NO. of B	ATALITIES		0	0	0	5	0	0	0	0	0	0	0	% SURVIVAL	100	\neg		
TREAT.	TEST		U_	1. 0	10				PLICATE						100			
NO.	SOLN	DAY	1	2	3	4	5	6	7	8	9	10		COMM	ENTS	i Majir Majir		4
		1	OK			 						>						
		2	οk									->						
	-11	3	5	4	5	4	3	6	5	٥	5	5						
4	5 %	4	0	6	10	0	٥	0	۵	6	U	4						a de la constanta de la consta
		5	14	11	G-	12	10	9	14	12	12	8						
		6	16	14	18	16	14	17	14	17	16	14						
	The second secon	7	100 A 10 A 10								<u> </u>	ļ	0116	MARK				
												1	TOTAL	MARY MEAN				
NO. of Y	OUNG		35	29	33	32	27	32	3.3	35	33	31	320	32.0				
NO. of Bi			<u> </u>	-	30	30	~ 1	ے د	رد	<u> </u>	_در	٠, ر		000				
	ATALITIES		0	0	0	0	0	0	0	0	0	0	0	% SURVIVAL	100			
XPOSU	RE DAY		0	1	2	3	4	5	6	7								
DATE			11-16	4-17	11-18			11-21	11-22									
DETERMI	NED / FED BY	<u>′</u>	<u> </u>	J S	T		20	Ge	1									
				G = GR	AVID E	E = EYE	D R =	RELEA:	SING YO	DUNG	AD = AI	DULT DE	EAD YD = YO	UNG DEAD				

Revised 11/92

PROJE	CT No.: 73	SE 14	42.3	2	_ CLIE	NT:	Ona	laska	Lau	125,1	1		•
TEST (DRGANISM:		ried	aphai	a di	bia				AGE	42	Yhc.	LOT No.: 578
SAMPL	E DESCRIP	TION:		Ėff/	un								
SAMPL	E No.(s):_ <u>5</u>	45.	01,	.02	, .0	3, -0	4						
LAB MI	EDIA/No.:_<	ultur	بو <u>ن</u> مر	dia	154	15. C	CL				CON	TROU	DILUENT: BlackRiver water
TEST S	START DATE	: 11-1	6-94	TIME	: /25c	<u>م</u>					TEST	END	DATE: 11-22-94 TIME: 1/30
ANALY	ST(s): 3 - HUT	<u>, c</u>	20kle						_ CODI	E:			PAGEOF
TREAT.	TEST			140		OFFS	PRING	PER RE	PLICAT	E			
NO.	SOLN	DAY	1	2	3	4	5	6	7	8	9	10	COMMENTS
		1	6K				<u> </u>	+	ļ.,			3	
		2	OK -		 			1		1		7	
_	1-1/	3	5	3	5	17	7	6_	6	5	4	5	
5	10%	4	0	0	18	U	U	U	D	U	U	14	
		5	14	/1	<u>(</u> -	14	11	1/1	3	10	12		
		6	19	16	14	16	16	18	13	14	17_	15	
		7						<u> </u>	J	<u></u>	<u> </u>	1	SUMMARY
													TOTAL MEAN
NO. of Y	OUNG		38	30	27	37	34	35	22	29	33	34	319 31.9
NO. of E	ROODS	gy light of											
	FATALITIES		0	0	0	0	0	0	O	0	0	0	O % SURVIVAL /00
TREAT.	The first of the second of the						·	_	PLICATE	~~~~~		Barragari, 11	
NO.	SOLN	DAY		2	3	4	5	6	7	8	9	10	COMMENTS
			6K -	+	 	-	-	-				>	
		2	OK	-	5	4	=				1	, ,	
	20%	3	5	5	ے ا	4	7	6	5_	6	6 *	2	*Adult injured during transfer - do not use
6		5	14	11	10	12	13	12	9	13	A 0	14	
		6		20	16	15	16	14	12	16	 - - 	15	
		7	16	100	10	1 /	10	77	//-	10	+ 1, -	/5	
	a disease. The same		L			<u> </u>		L	L colo	l 91-ja	¥	J	SUMMARY
								Fig.					TOTAL MEAN _ 9
NO. of Y	OUNG		35	36	31	33	36	32	26	3.5		34	298 33.1
NO. of B													
	ATALITIES		0	0	0	0	0	0	0	0		O	O % SURVIVAL O O
EXPOSU	RE DAY		0	1	2	3	4	5	6	7	1		
DATE	MED IFFO	*******		7		11-19.		11-21	7	.			
JETEHM	INED / FED BY		22	J5	35		J3	4	(k		, n	7111 T T	TAD VD VOLING DEAD
				U = U h	14 V IU	C = CYE	UH=	HELEA:	SIING Y (JUNG	ハレョハし	フロヒモロと	EAD YD = YOUNG DEAD

PROJE	CT No.: 75	El	42.3	۷	_ CLIE	NT:	Ona	laska	Lo	indfi	11		
TEST	DRGANISM:	Ce	riede	aphai	a du	bia				_ AGE	_ < >	LYLC	LOT No.:578
SAMPL	E DESCRIP	TION:_	E	Ff/c	un-	/ _							
SAMPL	E No.(s): <u>5</u>	45.0	21, -	OZ,	-03,	.04	<i>{</i>						
LAB ME	EDIA/No.:_<	ultur	e Me	dia/	545.	. <u>CC</u> L					CON	TROL	DILUENT: Black River water
TEST S	TART DATE	: 11-1	6-94	TIME	E: /250	<u>ر</u>							DATE: 11-22-94 TIME: 1130
	ST(s): 3 - HUT								COD	E:			PAGE 4 OF 5
TREAT.	TEST			a i i an		OFFS	PRING	PER RE	PLICAT	E		ir os Vals	
NO.	SOLN	DAY	1	2	3	4	5	6	7	8	9	10	COMMENTS
		:1	OK									7	
	:	2	OK	<u> </u>	+							->	
_,		3	4	3	7	5	6	5	4	4	6	6	
	40%	4	G.					9	6			→	
	•	5	િ	10	12	11	11	6	\mathcal{U}	11	12	11	
		6	13	16	18	16	/3	16	13	15	14	14	
		7			<u> </u>		<u></u>	<u> </u>		<u> </u>			
													SUMMARY
NO. of Y	OLING		1 2 2	29	37	135	30	30	2.0	1 30	132	151	TOTAL MEAN
NO. of B			25	1-64	3/	32	30	130	28	30	32	3 /	204 3014
	ATALITIES		0	0	0	0	0	0	0	0	0	0	9 % SURVIVAL 100
TREAT.	TEST	11/31				OFFSI	PRING F	ER RE	PLICATE	Ē			
NO.	SOLN	DAY	1	2	3	4	5	6	7	8	9	10	COMMENTS
		1	OK -									-3	
		2	OK -	<u> </u>				<u> </u>			<u> </u>	>	
8	80%	3	4	6	5	6_	4	6	6	5	6	5	·
8	80%	4	G-									7	
	-	5	12	9	12	10	10	11	12	10	13	Ш	
		6	12	10	13	1	11	12	12	15	12	13	
		7		<u></u>		<u> </u>	<u> </u>	L	Ļ	<u> </u>	<u> </u>		
													SUMMARY TOTAL MEAN
NO. of Y			28	25	30	27	25	29	30	30	31	29	284 28.4
NO. of Br													
	ATALITIES		0	0	Ö	0	0	0	Ò	Ò	0	<u></u>	O % SURVIVAL 100
EXPOSU	RE DAY		0	1	2	3	4	5	6	7	1		
DATE				4-17				11-21			Į		
DETERMI	NED / FED BY		<u> 22</u>	J5	JS	35	27	A	ge		j		

PROJE	CT No.: 73	= 14	232	-	CLIE	NT:	00	alas	ka (and-	t, 11		•				
TEST C)RGANISM: _	<u> </u>	rioda	phna	_duk	214			•	AGE:	<u> </u>	the		LOT No.: _	578		
	E DESCRIPT									·-· · · · · · · · · · · · · · · · · · ·							
SAMPL	E No.(s): 5	45.0	21, .	02 <u>, .</u>	03,	.04											
LAB ME	EDIA/No.:	Cul	ture	ried	ia /	545	r, <u>C</u>	<u>CL</u>						ack Rive			
	TART DATE				<u>ناء: دا:</u>	>					TEST	END D	DATE: //-	22-94			
ANALY	ST(s): <u> бен</u>	ΔT /	Coci	kle_					CODE	=:	-				_PAGE <i></i>	OF _	
TREAT.	TEST	184.000 - 636.00				OFFS	PRING I	PER RE	PLICATI	Ε							
NO.	SOLN	DAY	1	2	3	4	5	6	7	8	9	10		COM	MENTS		
	Lab	1	OK	+==	+				+			 					
	Iluc	2	3K	+		=	71				-	7					
9	,	3 4	4	6	5	5	230 3	2	6	3_	5	 					
	3.7%	5	G -	//	1/1	+	9	10	12	//	10	8					
		6	175	18	13	16	16	15	19	14	1/2	7.3					
		7	1 +		13	16	10	10	11-	17	1 F	10					ļ
					J		-J			1		1	SUM	IMARY	7		
					·								TOTAL	MEAN			
NO. of Y			35	35	29	32	28	27	37	21	32	25	301	30./	4		
	FATALITIES		0	0	0	0	0	0	0	0	0	0	0	% SURVIVAL	100	٦	
TREAT.	TEST						PRING F										
NO.	SOLN	DAY	1	2	3	4	5	6	7	8	9	10		СОМІ	MENTS		
		1															
		2															
		3															
	-	4				ļ	-										
	-	5		-			 	ļ									
	ļ	6 7		 	-		-				 						
										<u> </u>	l		SIIM	MARY	ח		
													TOTAL	MEAN			
NO. of Y	OUNG				Ī	Ĭ	Ī		1						1		
NO. of BI																٦	
	ATALITIES						ļ							% SURVIVAL	1		
EXPOSU	RE DAY		0	1	2	3	4	5	6	7							
DATE	NED / FED BY		71-16	11-17	リ-18 ゴs	11-19 35	7520	11-21	11-62		ļ						
OCT CLIMI																	

Inhibition Concentration Calculation (ICx)

CH2M Hill July 1991

Client: ONALASKA LANDFILL

Project Number: TSE 142.32
Test Solution: EFFLUENT
Test Date: 11/16/94
Test Organism: CERIODAPHNIA dubia

Response Measured: REPRODUCTION

Concentration (%)	Mean Response	Smoothed Mean Response
Control	31.200	33.150
3.70	35.100	33.150
5.00	32.000	32.337
10.00	31.900	32.337
20.00	33.111	32.337
40.00	30.400	30.400
80.00	28.400	28.400

Toxic Units IC25 (%)

Linear Interpolation Estimate> 80.00

CHRONIC TEST INITIAL CHEMICAL DATA:

PROJECT No.: TSE 142.32 CLIENT: Onalaska Landfill

TEST ORGANISM: Fathcad Minnow LAB MEDIA NO.: Culture mudia / 545. CFL

SAMPLE No.(s): 545.01, .02, .03, .04 CONTROL/DILUENT: Black River

SAMPLE DESCRIPTION: Effluen +

TEST START DATE: 11-16-94 TIME: 0830 TEST END DATE: 11-23-94 TIME: 0830

ANALYST(s): Schut, Cookle CODE:

TREAT	TEST			1		SURE		•		
NO.	SOLN	PARAMETER	-0-	1	2	- 3	4	5	-6;	COMMENTS
1	Lab	DØ pH CØND	8.4 8.1 0.17	8.1	8.1 8.1 .18	8.2 7.9 .17	8.2	7.9	8,3 8.2 0.21	
2	Black River	DØ pH GOND	8.4 8.0 .20	8.2	8.2 8.0 ,19	8.5 7,8	8.4 7.8 .19	7.9 7.9 0.19	8.2 8.0 0.19	
	3.7 %	pH GOND	8.4 7.9 .21	8.0	7.9 7.9 .22	8,4 7,9 .21	8.4 7.8 .20	7.9 7.8 0.20	8.1 8.0 0.21	
4	5 /.	DO pH COND	8.5 7.9 .21	8.1	80	8.3 7.9 .21	8.4 7.8 .20	8.0 - 7.8 0.21	8,1 8,1 0,21	
.5	10 %	DO pH GOND	8.4 7.9 .23	8.1	8.1	8.2	8.4 7.8 .22	8.0 7.8 0.22	8.1 8.1 0.22	· ·
6	20%	pH COND	8.5 7.9 5329.2	8,0	80	8.0	8.4 7.9 .25	7.9 7.8 0.25	8, 1 8, 1 0.25	
7 -	40%	pH COND	8.5 7.9 2340-	80	8,0		8.4		8.2 8.2 0.28	
 	DATE SAMPLE NO DETERMINE	D BY	11-16 25	11-17 1.02	11-18 -03		11-24 .04		11-22 .04 3C	

*DO = DISSOLVED OXYGEN (mg/L)

COND = CONDUCTIVITY (mmho)

CHRONIC TEST CHEMICAL DATA* (1-4 TREATMENTS)

PROJECT No .: TSE 142.32 CLIENT: Onglask	a Landfill
TEST ORGANISM: Fathead Minnow	LAB MEDIA/No.: Culture media /545.CFL
SAMPLE No.(s): 545,01, .02, .03, .04	CONTROL/DILUENT: Black River
SAMPLE DESCRIPTION: Efflunt	
TEST START DATE: 11-16-94 TIME: 0830	TEST END DATE: 11-23-94 TIME: 0830
ANALYST(s): Schut, Cookle	CODE:

INITIAL CHEMICAL MEASUREMENT

TREAT.	TEST					OSURE	DAY			
NO.	1	PARAMETER	0	1	2	3	4	5	6	COMMENTS
	6 //	DO	8.5	8:1	8.1	8.4	8.4	8,0	8.2	
8	80%	pH	7.9	8.2	8.1	80	7.9	8.0	8.3	
		COND	-40	-38	.47	.40	.38	0.38	0.38	
	Ilux Lab	DO	8,4	8.2	80	81	8.3	8.0	8.3	
q	3.7%	pН	8.0	8,2	80	7.8	8.1	8,1	8.2	
		COND	,22	-19	.20	1.19	.20	0.24	0.22	
		DO								
3		pН								
		COND								
		DO								
4		pН								
		COND								
	DATE		11-16	11-17	11-18	11-19	11-20	1/-21	11-22.	
	SAMPLE No.			-02	.03	.03	-04	-04	.04	
	DETERMIN	NED BY	22	gr	M	gr	a	52	JC	

FINAL CHEMICAL MEASUREMENT

TREAT	TEST				EXP					
NO.	SOLN	PARAMETER	1	2	3	4	5	6	7	COMMENTS
В	807	DO pH	7.2 8.2	6.2	7, 2 7, 7	6.0	6.9 7.9	8.1	6.0 7.6	
9	IWC Lab 3.71/.	DO pH	6.9	6.3 7.8	7.4	6.1	6.9	7.8	6.7 7.7	
3		DO pH								
4		DO pH								
	DATE DETERMIN	NED BY	11-17	11-18	11-19 Js	11-20	11/2/	11-22	11-23 JZ	

CHRONIC TEST FINAL CHEMICAL DATA*

PROJECT No.: TSE 142.32 CLIENT: Onalgo	ska Landfill
TEST ORGANISM: Forthead minnow	LAB MEDIA /No.: Calture media / 545.CFL
SAMPLE No.(s): 545.01, .02, .03, .04	CONTROLIDILUENT: Black River
SAMPLE DESCRIPTION: Eff/un+	
TEST START DATE: 11-16-94 TIME: 0830	TEST END DATE: 11-23-94 TIME: 0830
ANALYST(s): Schut, Cookle	CODE:

TREAT	TEST	PARA-				JRE DAY			
NO.	SOLN	DO pH	7.6 7.8	6.7 7.6	7.8 7.7	7.4 7.6	7. Q 7. 9	7.8 8.0	6.9 7.8
2	Black	DO pH	7.6	7.0 7.6	7.6	7.2	7.3 7.9	8.0 8.0	7.2 7.7
3	3.7 %	Ð⊙ pH	7.8	7.0 7.6	7.7	7.2 7.5	7. <i>4</i> 7.9	8.2 8.0	7.4
4	5 %	DO pH	7.8	7.0 7.6	7.8	7.2	7.3 7.9	8,0	7. <i>Y</i> 7. <i>y</i>
5	10%.	DO pH	7.9	6.9	7.7	7.2	7.5 7.9	8.1	7.4
6	20%	DO pH	7.3	7.0	7.6	7.3	7.6	8.0	7.4
7	40%	DO pH	7.7	6.4 7.7	7.7	6.8	7.4	8.1	7.4
	DATE DETERMINED B	Y	11-17 N	11-18 Ar	11-19 Js	11-20 4nls	11-21	1/-22 70	//- 23 JZ

*DO = Dissolved Oxygen (mg/L) COND = Conductivity (mmho)

COMMENTS:

CHRONIC BIOASSAY SURVIVAL DATA

PROJEC	T No.: _ 75 E GANISM: _F	142.32	-		CLIEN	IT:	On	alask	a Land	15:11						
		otherd n	ninne	WS				_ AGE: .	2244	_ LOT No.:	1282					
SAMPLE	DESCRIPTION: No.(s): 545	Eff)	03	T CH												
LARMED	IA/No.: Cult	rice mad	in / 5	545	CFL			CONT	ROL/DILUE	NT: Black	K Rive	<u> </u>			***************************************	
TEST ST	ART DATE: //	16-94 TIN	1E: 0	830				TEST	END DATE:	11-23-9	4 TIME:	0830				······································
ANALYST	(s): Schut,	Cookle								***	CODE:					
THEAT.	T TEST				FATALI					OWREH	96	MEAN			ALM #F11=-A	
NO.	SOLUTION	REP 1	2	3	0	5	0	0	SURVIVORS	FATALITES /	90	SURVIVAL			OMMENTS	
1		B 0	0	0	0	+ 7	00			+ ;	88.9	!	×	9 fish	se +	
'	Las	$C \cup O$		0	18	0	0	ŏ	8	0	100	89.7%	a	1 fish	lost 1	n handlin
		D 0	0	0	12	0	Ŏ	0	8	2	80					<u> </u>
		A O	0	1	11	1	0	0	7	.3 `	70					
2	Black	BO	0	0	7	1	0	0	8	2	30	0-1				
	River	C 0	0	$\perp \perp$	0	0	0	0		1	90	85%				
	KIVO	D O	0	0	0	0	0	0	10	0	100					
		A O	6	0	1 !	0	1	0	8	2	80	1				
3	3.7%	B 0	0	Ó	11,	0	Ŏ	O	9		90	87.5%				
	,	C O	0	0	0	8	0	0	9		90	0, 3,.				
	8		0	1/0			0		7		100	<u> </u>				
4		A O	0	0	0	0	0	0	10	0	100	۰,				
7	5%	COX	0	0	1	ŏ	0	0	8	+ + +	88.9	87.2/				
			0	0	3	Ŏ	1	0	6	\dot{u}	60		•			
		A O	0	0	0	Oa	0	0	9	0	100					
5	10%	ВО	0	0	1	0	0	O	9	Ti	90	92.5%				
		CO	0	0	0	Ö	8	1	9		90					
		DU	0	0	O	1	0	0	9		90					
		A O	0	1	(0	0	7	3	70					
6	227	В	0	8	2	0	0	0	8	2	80	2027				
	20%	COX	0	0		0.	0	0	8	1	88.9	79.7/				
		D Q	ಎ	0	'1		0	0	8	2	80					
		A 0	0	0	0	0	0	0	10	0	100]				
7	40%	вО	0		0	0	0	0	9	<u> </u>	90	92.5%				
	90%	C 0	8	9	0	Q	0	8	10	0	100	14.3/.				
		D O	0	1115	0	11 2	0	0	8	2	80					
	DATE	<u> </u>			11-20			17-23								
[E	ETERMINED B	Y IS	<i>Q</i> 3	J5 '	mu-	ープと	アと	5て								
	FEEDING	AM		-			~									
Form BLCT05		PM 🗸	1	1		1		/						F	Nevised 11/92	

CHRONIC BIOASSAY SURVIVAL DATA

PROJECT	No.: <u>73E</u> BANISM: <u>F</u> 9	142	.3 Z			CLIEN	τ: <u>Ο</u> ν	iala.	ska	Land	Gill				
TEST ORG	GANISM: _F9	thea	dm	inne	w	<u></u>			AGE: _	124h	LOT No.:	1585			
SAMPLE [DESCRIPTION:		≡££,	lun	<u> </u>										
SAMPLE N	No.(s): 545	.01,	.02	.03	, .04	<u> </u>	·	···							
LAB MEDI	No.(s): <u>545</u> A/No.: <u>Cul</u>	trice	_ mi	dia /	546	C. CF			CONTI	ROL/DILUEN	T: Blac	k Riva	•		
TEST STA	RT DATE: 11-	162	<u>14</u> tin	ЛЕ: <u>О</u>	<u>830</u>				TEST	END DATE:_	11-23-94	TIME:_	0830		
	(s): Schut	, Ca	sokle.									CODE:			
THEAT.	SOLUTION					FATALI				TOTAL NU	MBEH	%	MEAN		2.2
NO.	SULUTION	REP A		0	8	0	3	+	<u> </u>			SURVIVAL	SUHVIVAL		COMMENTS
_		B	12	0	0	19		0	0	10	0	100		a	one fish lost in
8	80%	C	0	0		++-	0	0	0	9		90	97.5%		handling
	0 - /	D	0		Ŏ	8	0	0	0	10	0	100	17.27.		7
	- 10	500000000000000000000000000000000000000		0	0	0	0				٥				handling only 9 fish set
	INC	A	0	D	0	0		0	0	10	0	100		X	only 9 fish set
9	3.7%	B	0		0	1	0	0	0	10	0	100	92%	•	ŕ
	(w/Lab)	D	8 x	D	0		0	0	0	9	2	77.8	1-70		
	(c) Laco)	Α	-	0	<u> </u>	 	0	0	-0	7		70			
3		В		 		 	 	-	 						
٥		C				-		ļ ———							
		D		 	ļ	 	 	-					1		
		Α													
4		В													f
•		C			 	 	ļ — — — — — — — — — — — — — — — — — — —								
		D		 											
	7	Α		ļ				<u> </u>							
5		В				 		 							
		C		 		 									
		D				 									
		Α				-									
6		В				 							1		
,		С													
		Ö					L						1		
	-	Α													
7		В													
,		C													
		Ö													ļ
	DATE		(/ />	1,0	11-6	11-70	11-71	1/- 22	(1-)7		L				
	ETERMINED B	γ	33	05	J5	11-20 Yrux	77	7 2	35						
	C. L. HVIII (C.D. D.	DAV	<u> </u>	47	2	A LITTE	<u> </u>	, <i>C</i>	8						
	FEEDING	AM		~	~		JE								
Form BLCT05		PM	V	1	/	/		/							Revised 11/92

CHRONIC BIOASSAY GROWTH DATA

PROJECT No.: 75E 142.32 CLIENT: Ohalaska Landfill

TEST ORGANISM: Fathed minnow AGE: 24H LOT No 1585

SAMPLE DESCRIPTION: Effluent

SAMPLE No.(s): 545.01, .02, .03, .04

LAB MEDIA/NO.: Culture media/545, CFL CONTROL/DILUENT: B/ack River

TEST START DATE: 11-16-94 TIME: 0830

ANALYST(s): Stark

CODE:

TEST	TREAT	TARE	TARE + DRY	TOTAL	Signif, Diff	erence Test	1029	5 Test
SOLN	REP	(mg)	WT (mg)	WT (mg)	No. Surv.	Organism Wt.	No. Exposed	Organism Wt.
	1A	1136.05	1140.04	3.99			10	0.399
las	1B	1126.97	1130.89	3, 92			9	0.436
	1C	1129.68	1133.48	3.80			9	0.422
	1D	1135.64	1139.22	3.58			16	0.358
01.10	2A	1117.59	1122.00	4.41			10	0.441
Black River	2B	1109.91	1114.01	4.10				0.410
River	2C	1107.43	1112.02	4.59				0.459
	2D	1137.03	1142.22	5.19				0.519
	ЗА	1139.66	1144.11	4.45			10	0.445
2 3.1	3B	1123.54	1135.07	6.53				0.653
3.7%	зс	1129.33	1134.53	5.20				0.520
	3D	1100.23	1105.29	5.06				0.506
	44	1104,94	1109.87	4.43			10	0.493
1 -1	48	1139.84	1142.84	3,00		c	10	0.300
5%	4C	1127.95	1132,59	4.64			9	0.516
	4D	1134.38	1138.04	3,66			. 10	0.366
	5A	1111.64	1116,12	4.48			' 9	0.498
10%	5B	1110,23	1114.22	3,99			10	0.399
101	5C	1118.12	1122.67	4.55			10	0.455
	5D	1118.54	1123.20	4.64	<u> </u>	1	10	0.464
	6A	1119.66	1123.88	4.22			10.	0.422
20/	6 B	1125,19	1129.70	4,51			10	0.451
201	6C	1103.44	1108.57	5.13			9	0.570
	:6D	1127.86	1132,26	4.40			10	0.440
	7A	1109.27	1114.20	4.93			10	0.493
40%.	7B	1134.91	1137,82	2,91				0.291
	7.C	1117, 14	1122.52]	0.538
	7D	1114.01	1113,17	4.16			/	0.416
	COM	MENTS:			Mean 1 =		Mean 1 =	
					Mean 2 =	III.	Mean 2 =	= 0.457

, ,	0.416
Mean 1 =	0.404
Mean 2 =	0.457
Mean 3 =	0.531
Mean 4 ≖	0.419
Mean 5 =	0.454
Mean 6 =	0.471
Mean 7 =	0.435
	Mean 2 = Mean 3 = Mean 4 = Mean 5 = Mean 6 =

CHRONIC BIOASSAY GROWTH DATA

PROJECT I	No.: 75	E 142-32	CLIENT: On	alaska	Land fil	1//	1-0-	
TEST ORG	ANISM:	Fothear	minnow		AGE: <u>~~</u> 9	LOT No	1585	
			fflum +					
SAMPLE N	o.(s):_ <u>\$</u>	45.01, -	02, -03,	-04	001170014	211 LIEU - 10 I	1 10	
			media/54					
			14_TIMÉ: _O	<u>830</u>		DATE: 11-23	<u>-94</u> TIME:_	0830
ANALYST(s): <u>5ta</u>	rk			CODE:			
TEST	TREAT	TARE	TARE + DRY	TOTAL	Signif Diff	erence Test	102	5 Test
SOLN	REP	(mg)	WT (mg)	WT (mg)	No. Surv.	Organism Wt.	No. Exposed	Organism Wt.
	8 1A			4.98			10	0.498
9n:1	8 1B	1130.73	1135.47	4.74			10	6.474
80%		1120.78	1125.63	4.85			10	0.485
	8 #D	1121.49	1126.08	4.59			9	0.510
. ,	q ZA	1127.70	1132.34	4.64			10	0.464
3.7%. W/lab	9 2B	1132.92	1137.48	4.56			10	0.456
l. Make	9 2C	1105.27	1109.21	3.94			9	0.438
0/100	9 2D		 	 			10	
		1108.13	1112.52	4.39			70	0.439
	3A							
	3B							
	3C				<u> </u>			
	3D							
	4A							
	4B						1	
	4C				1		.	
	4D							
	-				ļ		 	
	5A				<u> </u>]	
	5B							:
	5C							
	5D					1	I	
	6A				1		Î	
	6B							
	6C				1		1	
	6D				1			
				1	-		-	
	7A							
	7B							74 Mariana (186
	7C							
	7D				1			
	COM	MENTS:			Mean 1 =	5	Mean 1 =	8 0,492
					Mean 2 =	I.		80.449
					Mean 3 =	=	Mean 3 =	
					Mean 4 :		Mean 4	
					Mean 5		Mean 5	
					Mean 6		Mean 6	
					Mean 7	·····	Mean 7	

Inhibition Concentration Calculation (ICx)

CH2M Hill July 1991

Client: ONALASKA LANDFILL

Project Number: TSE 142.32 Test Solution: EFFLUENT
Test Date: 11/16/94
Test Organism: FATHEAD MINNOW

Response Measured: GROWTH

Concentration (%)	Mean Response	Smoothed Mean Response
Control	0.405	0.458
3.70	0.533	0.458
5.00	0.420	0.458
10.00	0.455	0.458
20.00	0.470	0.458
40.00	0.435	0.458
80.00	0.490	0.458

Toxic Units IC25 (%)

Linear Interpolation Estimate> 80.00

BIOASSAY SAMPLE RECEIPT CHARACTERIZATION

CLIENT	ONALASKA	GROUNDWATER	TREATA	IENT	PROJECT	NO.	1361	12.52
DATE		SAMPLE NO.		TEMP	DO		COND	
RECVD	.	DESCRIPTION		(C)	(mg/L)	pН	(mmho)	INITIALS
	54	3.02 545	. 01	-0	9.8	7 2	U1	77
11-15-94	IEFF-LU	ENT # 1		50	7.0	7.3	.41	100
FILTER_		RINATE	l	JSE: IMM	EDIATE _	STO	RE (4 C)	
ALIQUOT	S HOMOGENIZ	ZED CONTA	INER TYPI	E (G/P) _	$ ho_{-}$ odol	R		1
		CLOUDY						į
COMMEN	ITS							
								1
DATE		SAMPLE NO.		TEMP	DO		COND	
RECVD		DESCRIPTION		(C)	(mg/L)	рН	(mmho)	INITIALS
	54	15.02		150	105	- ^	2	1,//
11-16-9	RIVE			15		7.9	.20	
FILTER	DECHLO	RINATE		JSE: IMM	EDIATE	STO	RE (4 C)	7
		ZED CONTA			_		` '-	7)
APPEARA	ANCE : CLEAR	CLOUDY		os <u>/</u>	COLOR _	42110	a)	
COMMEN						7		
1								
DATE		SAMPLE NO.		TEMP	od		COND	
RECVD		DESCRIPTION		(C)	(mg/L)	рH	(mmho)	INITIALS
		5,03		. 0	11 7	20	27	
11-18-9	4 EFFC	VENT =2		10	10.7	.0.0	.37	J/#
FILTER_	/ DECHLO	PRINATE		JSE: IMM	EDIATE	V sto	RE (4 C) _	_/U
ALIQUOT	S HOMOGENI	ZED CONTA						
		CLOUDY _x					2	
COMMEN	NTS							
							•	;
DATE		SAMPLE NO.		TEMP	DO		COND	
RECVD		DESCRIPTION		(C)	(mg/L)	рΗ		INITIALS
1 19 4	545.0	04		90	a </td <td>91</td> <td>25</td> <td>51/11</td>	91	25	51/11
11-18-9	FFFLU	04 IENT #3		9	1.0	0.1	•35	13/19
FILTER		DRINATE		USE: IMM	IEDIATE	STO	RE (4 C) V	
		ZED CONTA					` /—	
		CLOUDY_					-	
COMME				•	_			

FORM BLST04

TEST TEMPERATURE SUMMARY

			ACUT	E TEST T	EMPERA	TURE			
		DATE							
	11-16-94	11-17	11-18	11-19	11-20				
AVG	20.1	19.9	19,8	20.0	20.2				-
MAX									
MIN									
SUM. BY:	mw -								
			CHRO		TEMPER	ATURE			
			CHRO	NIC TEST	TEMPER	ATURE			
			CHRO	NIC TEST	TE	ATURE			
	11-16-94	11-17	CHRO			N-2i	11-22	11-23	
AVG	11-16-94	11-17 25.3		DA	TE		11-22	11-23	
MAX			11-18	DA 11-19	TE 11-20	1/- 2.[
MAX MIN	25.2		11-18	DA 11-19	TE 11-20	1/- 2.[
MAX MIN			11-18	DA 11-19	TE 11-20	1/- 2.[
MAX MIN	25.2		11-18	DA 11-19	TE 11-20	1/- 2.[
MAX MIN SUM. BY:	25.2 Mw -		11-18	DA 11-19	TE 11-20	1/- 2.[
MAX MIN SUM. BY:	25.2 Mw -		11-18	DA 11-19	TE 11-20	1/- 2.[
MAX MIN	25.2 Mw -		11-18	DA 11-19	TE 11-20	1/- 2.[

Revised 7/25/90

SUPPLEMENTAL CHEMICAL DATA SUMMARY

PROJECT NO	TSE 142,32	CLIENT <u>Onalaska Landfill</u>
TEST DATE	11-16-94	SUMMARIZED BY 4nw

LABORATORY CONTROL				
		CONTRO	L I.D.	
	545. ADL	545, AFL	545,CCL	545, CFL
TOTAL ALKALINITY mg/L CaCO3	64	64	70	56
HARDNESS mg/L CaCO3	90	80	95	75

SAMPLE DESCRIPTION			
0: 0:		SAMPLE NO.	
Back River	J45.02		
TOTAL ALKALINITY mg/L CaCO3	82		
HARDNESS mg/L CaCO3	115		
TOTAL RESIDUAL CHLORINE mg/L	NA		
TOTAL AMMONIA mg/L	0.02		

SAMPLE DESCRIPTION				
- MI		SAMPLE	NO.	
Effluent	545.01	545.03	545.04	
TOTAL ALKALINITY mg/L CaCO3	NA	164	184	
HARDNESS mg/L CaCO3	N4	215	165	
TOTAL RESIDUAL CHLORINE mg/L	6		D	
TOTAL AMMONIA mg/L	0.02	0.03	0.28	

SAMPLE DESCRIPTION	
	SAMPLE NO.
TOTAL ALKALINITY mg/L CaCO3	
HARDNESS mg/L CaCO3	
TOTAL RESIDUAL CHLORINE mg/L	
TOTAL AMMONIA mg/L	

NA = Not Analyzed

^{* =} Duplicate for QA

APPENDIX B CHAIN-OF-CUSTODY FORMS

CHM HIL	L		CHAIN	of cu	STODY RE	ECORD FO	OR NPDES CO	MPLIANCE BIOM	ОЛІТОЯ	RING	
GROUND Facility -	Mala exerti Bill	SKO Reatment Wood	7		Shipping Ad 650		4 Hwy Z, C	5465C nalaska,WI	-	NPDES Number Ship Samples to:	
Sample Kit Trac	king infor	mation -		☐ Fed	x	nt (Check O	Prepa Shipp	red by/Date: My ed by/Date: 1 - 9 - 9	• .	CH2M HILL Bioassay L 15779 W. Ryerson Roa New Berlin, WI 53151 Phone: (414) 784-0448 Fax: (414) 784-0353	d
Composite Sam	ple Inforn	nation				Description	n of Sampling Site			Sample Container	
Flow Proportion Samples/Hour Total Hours Initiated: Date Ended: Date Chilled During C		7 24 -13-94 1/-14-9	Time Total Vo Time Time Yes	Sample	110 m/L	Effi aT STa	old onala	STropping Tor ska Landfi	wor U	Plastic Glass New Plastic Glass New Refrigerant Used For Shipping Wet Ice Blue Ice Othe Sample(s) Shipped Via Fed X Other Bioassays Required Acute Chronic Other	r 🗆
Sample Description	Date	Time	Sampl Comp	e Type Grab	No. of Containers	Volume	Sam	oled by (Signature)		Comments	For Lab Use Sample ID No.
Relinquished By					1		1	Date //-14-94		Condition of Seal Upon Receipt	by Lab
01	PoraTo	· > >	<i>C</i>	Till	com	L.W	ove	Time /0/20 am	Intact	Other (Describe)	
Received By: (S	Ignature)		Date		Reilnquish	ed By: (SIg	gnature)	Date		By Lab: (Signature)	Date//- 15-94
			Time					Time	WW	MATAM	Tlme

CHM HIL	L		CHAIN	OF CU	STODY R	ECORD F	OR NPDE	S COMP	LIANCE BIO	NONITOR	ING		
Client Name Onala TReatme	iska G en tobi	Round acility	Dater	Client	Shipping Ad 3650 (ounty i	Hwy Z,	Onali	iska WI	54650	NPDES Num Ship San		
Sample Kit Trac No. of Cooler Total No. of Bot	king Info	rmation		Method	d of Shipme	nt (Check C	One)	Prepared) OK Shipped I	by/Date: PEM M.FA py/Date: -9-94/	Rank	15779 W. New Berl Phone: (LL Bioassay Ryerson Roa in, WI 53151 (414) 784-0448 (414) 784-035	ad B
Composite Sam	ple Inforn	nation				Descriptio	n of Sampl	ing Site			Sample Conf	tainer	
Flow Proportion	nal 🗌	Т	ime Inter	val 🗌							Plastic (4)	Glass □ New □	Used 🗌
Samples/Hour			Volume	/Sample							Refrigerant (Jsed For Shipping	
Total Hours			Total Vo	olume							Wet Ice 🗌	Blue ice 🗌 Oth	er 🗆
1											Sample(s) Si	nlpped Via	
Initiated: Date	•••		Time		-					1	UPS 🕡 F	ed X 🗌 Other [
Ended: Date Chilled During C	 Collection		Tlme Yes □			-					Bloassays Re	gulred :hronic [240iher [7
Sample Description Norwites	Date	Time	Samp	le Type Grab	No. of Containers	Volume 5 gal	Wi		d by (Signature)			comments	For Lab Use Sample ID No. 545.02
Relinquished By	and Title	(Signatu	re)	Sil	lleau L	Wor			Date //-/5-94	┦. /	Condition of Other (Seal Upon Receipt	by Lab
Received By: (S			Date Time		Υ	ed By: (Slo			Date Time	Received	By Lab: (Sign		Date //-/6-94 Time / 0,30
												NUTION: Orland Lab	

CHIM HIL	L		CHAIN	OF CU	STODY RI	ECORD F	OR NPDES	COMPLIANCE BIO	MONITOR	ING	
Client Name (Water T	Reatm	ent Fo	ond	Client:	Shipping Ad	ddress County	HW47	. Maluskau	1545	NPDES Number Ship Samples to:	
Sample Kit Trac No. of Cooler Total No. of Bot	2	rmation	7	Method	of Shipme	nt (Check C	Pr	epared by/Date;		CH2M HILL Bloassay L 15779 W. Ryerson Road New Berlin, WI 53151 Phone: (414) 784-0448 Fax: (414) 784-0353	•
Composite Sam	nple Inforr	nation				Description	n of Sampling	Site		Sample Container	
Flow Proportion	nal 🗆	T	ime inter	val 🗌						Plastic ∭ Gloss ☐ New ☐	Used 🗌
Samples/Hour			Volume	/Sample						Refrigerant Used For Shipping	
Total Hours			Total Vo	olume	·					Wet Ice 🔲 Blue Ice 🔲 Other	·
										Sample(s) Shipped Via	
Initiated: Date	-		Time							UPS 🔯 Fed X 🗌 Other 🗌	
Ended: Date			Time							Bioassays Required	
Chilled During (Collection		Yes [) No						Acute M Chronic MOlher □	
Sample				e Type	No. of						For Lab Use
Any water	Date //-/5-84	//:30 am	Comp	Grab	Containers	Volume		ampled by (Signature)		Comments	Sample ID No. 545.02
Mrs war	11-4)-61	11.50-			 	1 300	Wille				343.02
! 	 	<u> </u>	-		<u> </u>						
_,,,,,,,,,									!		
Relinquished By	and Title	(Signatu	re)			,		Date //-/5-574		Condition of Seal Upon Receipt	by Lab
0)	serle	· ·	WZ	lem	1 L.W	revel		Time 8150/	Intact	Other (Describe)	
Received By: (S			Date		T	ed By: (Sig	jnature)	Date			Date //-/6-94
			Time					Time	Ka		Time 1030

DISTRIBUTION: Original - Lab, Yellow - Client

CHIM HILL	CHAIN OF CU	STODY R	ECORD FO	OR NPDES	COMPLIANCE BION	ONITOF	RING	
Client Name Onalas Ka GA TREatment Facili Bill Wood	OUND Client	Shipping A	ddress		546: Z, Onalaska U		NPDES Number Ship Samples to:	
Sample Kit Tracking Information No. of Cooler of Total No. of Bottles	Metho	d of Shipme	nt (Check O	ne) Pr	epared by/Date;		CH2M HILL Bioassay L 15779 W. Ryerson Roa New Berlin, WI 53151 Phone: (414) 784-0448 Fax: (414) 784-0353	d
Composite Sample Information			Description	of Sampling	Site		Sample Container	
Flow Proportional	Time Interval						Plastic ☑ Gloss ☐ New ☐	Used 🗌
Samples/Hour	Volume/Sample						Refrigerant Used For Shipping	
Total Hours	Total Volume						Wet Ice Blue Ice Other	r 🔲
							Sample(s) Shipped Via	
Initiated: Date	TIme	_					UPS K Fed X Other	·
Ended: Date	Time						Bioassays Required	
Chilled During Collection	Yes No	No. of					Acute Chronic Other	·
Sample Description Date Time	Sample Type Comp Grab	┥	Volume	S	sampled by (Signature)		Comments	For Lab Use Sample ID No.
Room Grab 11-15-54 11:30 -		/	5 gul	- h	sampled by (Signature)	1		545.02
				· · · · · · · · · · · · · · · · · · ·				
Relinquished By and Title (Signat	•	lan 1	Lux	d	Date ///5/54	(t) Intact	Condition of Seal Upon Receipt Other (Describe)	by Lab
Received By: (Signature)	Date	1	ned By: (Slg		Date	Regelved	By Lab: (Signature)	Date //- 16-94
	Time	<u> </u>	·		Time	Ma	Ren M. Joins	Time /030

DISTRIBUTION: Original - Lab, Yellow - Client

CHM HIL	1		CHAIN	OF CU	STODY RI	ECORD FO	OR NPDE	S COMPLIAN	ICE BIQN	MONITOR	IING	
Client Name C GROUNDW BI	Inchasi otertre		Facility	Client	Shipping A. 8650	ddress Count	y Hwy	Z, Duala	ska, Wi	_546 <i>5</i> 0	NPDES Number Ship Samples to:	
Sample Kit Tra No. of Cooler Total No. of Bo	5	rmation of —	7_ ;	Method	of Shipme	nt (Check O	ne)	Prepared by/D Shipped by/Da //- 9-	ate:		CH2M HILL Bioassay L 15779 W. Ryerson Road New Berlin, WI 53151 Phone: (414) 784-0448 Fax: (414) 784-0353	_
Composite San	nple Infor	mation				Description	n of Sampli	ing Site			Sample Container	
Flow Proportion	nal 🗌	Т	ime Inter Volume Total Vo	/Sample							Plastic Glass New Refrigerant Used For Shipping	
Total Hours				e							Wet Ice ☐ Blue Ice ☐ Other Sample(s) Shipped Via UPS ☑ Fed X ☐ Other ☐	
Ended: Date Chilled During (Collection	:	Time Yes 🗆	No							Bloassays Required Acute Chronic Other	
Sample Description	Date	Time	Sampl Comp	e Type Grab	No. of Containers	Volume		Sampled by (Signature)		Comments	For Lab Use Sample ID No.
Min Waty	11-1594	11:5300			/	Sgul	۷.	/ Ilian.	L. av o	vol		545.02
Relinquished By	•			llea		word	′		11-15-84 3!30 m	1 /	Condition of Seal Upon Receipt Other (Describe)	by Lab
Received By: (S	Signature)) 	Date		Relinquish	ned By: (SIg	nature)	Date	***	Received		Date //-/6-99 Time /030
					••							

DISTRIBUTION: Original - Lab, Yellow - Client

CH?M HIL	L		CHAIN	OF CU	STODY R	ECORD FO	OR NPDE	SCOME	LIANCE BION	IONITOF	RING			
Client Name O GROUND FACIL BIL	nalas Jater	Ka Treatm	ent	Client	Shipping Ad	ddress	u Hww	7 E	naloska,u)I	NPDES			
B,1	<u>1 wa</u>	DD		1 47		<u> </u>	7 1109	L, U				Samples to:		
Sample Kit Trac						nt (Check O			by/Date:		CH2M	HILL Bioas	say L	aboratory.
			٦,	\ 1	. /			Q	(my)		15779	W. Ryersoi	n Roa	d
No. of Cooler	<u></u>	_ of —	t,	Fed	x	☐ Pickup		Shipped	by/Date:		New E	Berlin, WI 5	3151	
No. of Cooler Total No. of Bot	tles	<u>L</u>	i	D s		Other		11.	-9-24		Phone	e: (414) 784	-0448	
				<i>1</i>			_		15 x 3		Fax:	(414) 784	-0353	
Composite Sam	nple Inforn	nation			,	Description	n of Sampli	ng Site			Sample (Container		
Flow Proportion	nal 🗆	, т	lme Inter	val							Plastic	Glass 🗆 I	New 🗌	Used 🗌
Samples/Hour		7	Volume	/Sample	170 mL						Refrigera	ant Used For Sh	lpping	
Total Hours		24	Total V	olume	170mL 3 gal						Wet Ice	Blue Ice	Othe	r 🗆
					0							s) Shipped Via		
Initiated: Date	//	-16	Time	12 No	10 1						11	Fed X 📈 (Other 🗆	
Ended: Date	//	-16	Time	12 No							and the same application in	s Required	211191	
Chilled During C			Yes [Chronic 🖟	, Nhar □	•
Sample	Jonection	T		le Type	No. of						Acdie	· Cilionic; sp	711101 LJ	For Lab Use
Description	Date	Time	Comp	T	Containers			Sample	d by (Signature)			Comments		Sample ID No.
= Ffmut waty	11-17-94		1	ļ	2_	142 gel	Wie	Zion "	L. wrold					545.03
				-								· · · · · · · · · · · · · · · · · · ·		
	1.711	/61	<u> </u>		<u> </u>	}			<u></u>			(C 1 1		h. lab
Relinquished By				-11-	1 c				Date //-/7-54	{	Condition	n of Seal Upon I	чесетрт	by Lab
			1	eller	n L, a				Time /2/30			er (Describe) -	7	
Received By: (S	Signature)		Date		Relinquish	ied By: (Sig	inature)		Date	Received	By Lab:	(Signature)	//	Date //-/8-94
			Time						Time	400	700	monnet	- 	Time 1600

CH?M HILL	CHAIN OF CUSTODY	RECORD FOR NE	PDES COMPLIANCE BIOMON	ITORING	
	Client Shippin	Address		NPDES Number	
Client Name Onalaska Groundwater Treaturent Facility	. +		a egilik	Ship Samples to:	
Sample Kit Tracking Information		ment (Check One)	Prepared by/Date:	CH2M HILL Bioassay	Laboratory
	,			15779 W. Ryerson Roa	
No. of Cooler — of —		_ 🗆 Pickup	Shipped by/Date:	New Berlin, WI 53151	
Total No. of Bottles	☐ UPS	_		Phone: (414) 784-0448	В
				Fax: (414) 784-035	
Composite Sample Information		Description of Sa	mpling Site	Sample Container	
Flow Proportional	Time Interval			Plastic 🛛 Glass 🗌 New 🛭] Used []
Samples/Hour	Volume/Sample / 70	2 m		Refrigerant Used For Shipping	
Total Hours 24	Time Interval Volume/Sample 70 Total Volume	2nd		Wet Ice ☑ Blue Ice ☐ Oth	er 🗆
/				Sample(s) Shipped Via	
Initiated: Date //-/7	Time 1200			UPS ☐ Fed X ☐ Other ₹	Thand del
Ended: Date 11-18	Time $\frac{1200}{1200}$			Bloassays Required	
Chilled During Collection	. /				- -1
Sample Sample	Sample Type No. o	, -		Acute Chronic Cother [For Lab Use
Description Date Time	Comp Grab Contain	1 1	Sampled by (Signature)	Comments	Sample ID No.
Procodwate, 11-18-54 12/22			Allem Lurad		545.04
					_
	+				
Relinguished By and Title (Signatu	ure)		Date //-/8-94	Condition of Seal Upon Receipt	t by Lab
000	(1)	2. wood	<u> </u>	Intact 🗆 Other (Describe)	
Received By: (Signature)	Date Relings	ilshed Bv: (Slanature	Date Rec	elved By Lab: (Signature)	

Time

Time

APPENDIX C
REFERENCE TOXICANT DATA

Table 1. Reference Toxicant Summary

CH2M HILL - Milwaukee, WI

Test Type:

Acute

Organism:

Ceriodaphnia dubia

Age

< 24 Hours

of Organisms / Conc.:

__

Test Duration:

48 Hours

Toxicant:

Sodium Chloride

Response:

Mean % Survival

Calculation:

LC50

Reporting Period:

January 94 - December 94

		Test	12 Mon	th Contro	Limits	In or Out	
	Test	LC50	Mean	Mean	Mean	of	
Test No	<u>Date</u>	(g/L)	LC50	+2 S.D.	<u>-2 S.D.</u>	Control	Action if Out of Control
52	1/18/94	2.21	2.49	2.83	2.15	IN	
53	2/22/94	2.45	2.49	2.83	2.16	IN	
54	3/23/94	2.45	2.47	2.76	2.17	IN	
55	4/13/94	2.45	2.47	2.76	2.17	IN	
56	5/31/94	2.67	2.48	2.80	2.17	IN	
57	6/29/94	2.32	2.47	2.80	2.14	IN	
58	7/29/94	2.45	2.48	2.80	2.17	IN	
59	8/31/94	2.52	2.49	2.80	2.17	IN	
60	9/28/94	2.58	2.47	2.73	2.21	IN	
61	10/18/94	2.45	2.47	2.73	2.21	IN	
62	11/28/94	1.54	2.38	2.95	1.80	OUT	a
63	12/14/94	2.60	2.39	2.98	1.80	IN	

a = water batch had low hardness (<70 mg/L); Retest 12/14/94

Table 2. Reference Toxicant Summary

CH2M HILL - Milwaukee, WI

Test Type:

Acute

Organism

Daphnia magna

Age

< 24 Hours

of Organisms / Conc.:

20

Test Duration:

48 Hours

Toxicant:

Sodium Chloride

Response:

Mean % Survival

Calculation:

LC50

Reporting Period:

November 93 - October 94

		Test	12 Mon	th Contro	l Limits	In or Ou	t
	Test	LC50	Mean	Mean	Mean	of	
Test No	<u>Date</u>	(g/L)	LC50	+2 S.D.	-2 S.D.	Control	Action if Out of Control
48	11/23/93	4.90	4.83	5.65	4.01	IN	
49	12/21/93	4.90	4.77	5.40	4.13	IN	
50	1/18/94	4.90	4.77	5.40	4.13	IN	
51	2/22/94	4.90	4.79	5.42	4.16	IN	
52	3/23/94	4.99	4.76	5.31	4.21	IN	
53	4/13/94	4.90	4.76	5.31	4.21	IN	
54	5/31/94	4.99	4.82	5.28	4.35	IN	
55	6/29/94	4.90	4.87	5.18	4.56	IN	
56	7/29/94	4.90	4.87	5.18	4.56	IN	
57	8/31/94	4.65	4.89	5.06	4.73	OUT	*No action taken; data too tight
58	9/28/94	4.51	4.86	5.14	4.58	OUT	*No action taken; data too tight
59	10/18/94	4.64	4.84	5.14	4.53	IN	

^{*}CommentThe LC50s of tests 57 and 58 were 5% and 7% different, respectively, from the mean LC50.

As the variance has been too low (tight) due to many of the previous tests with identical results, no action was taken. This is due to an artifact of the statistical analysis.

Table 3. Reference Toxicant Summary

CH2M HILL - Milwaukee, WI

Test Type:

Acute

Organism

Pimephales promelas

Age

10 ± 2 Days

of Organisms / Conc.:

20

Test Duration:

96 Hours

Toxicant:

Sodium Chloride

Response:

Mean % Survival

Calculation:

LC50

Reporting Period:

January 94 - December 94

		Test	12 Mor	th Contro	l Limits	In or Out	
	Test	LC50	Mean	Mean	Mean	of	
Test No	<u>Date</u>	(g/L)	LC50	+2 S.D.	-2 S.D.	Control	Action if Out of Control
50	1/18/94	7.87	7.04	9.07	5.00	IN	
51	2/14/94	7.24	6.95	8.84	5.06	1N	
52	3/14/94	6.67	6.88	8.73	5.03	IN	
53	4/18/94	8.31	6.95	8.94	4.95	IN	
54	5/16/94	9.53	7.23	9.56	4.90	IN	
55	6/13/94	6.49	7.26	9.54	4.98	IN	
56	7/11/94	5.47	7.17	9.64	4.69	IN	
57	8/8/94	5.41	7.07	9.72	4.42	IN	
58	9/12/94	5.81	6.91	9.60	4.22	IN	
59	10/10/94	5.79	6.85	9.61	4.09	IN	
60	11/7/94	5.76	6.61	9.16	4.06	IN	
61	12/8/94	5.98	6.63	9.16	4.09	IN	

Table 4. Reference Toxicant Summary

CH2M HILL - Milwaukee

Test Type:

Chronic

Organism:

Ceriodaphnia dubia

Age:

< 24 Hours

of Organisms / Conc.:

10

Test Duration:

7 days

Toxicant:

Sodium Chloride

Response:

Mean No. of Young per Adult

Calculation:

25% Inhibition Concentration (IC25)

Reporting Period:

December 93 - November 94

						In or Out	
	Test	IC25	Mean	Mean	Mean	of	
Test No	<u>Date</u>	(g/L)	IC25	+2 S.D	<u>-2 S.D.</u>	Control	Action if Out of Control
49	12/3/93	1.01	1.01	1.41	0.61	IN	
50	1/7/94	0.71	0.98	1.40	0.56	IN	
51	2/22/94	0.85	0.96	1.37	0.54	IN	
52	4/5/94	1.06	0.99	1.36	0.61	IN	
53	5/4/94	1.27	1.01	1.42	0.60	IN	
54	5/31/94	1.05	1.01	1.42	0.60	IN	
55	6/18/94	1.12	1.04	1.42	0.66	IN	
56	7/8/94	1.08	1.05	1.42	0.67	IN	
57	8/4/94	1.09	1.05	1.43	0.67	IN	
58	9/16/94	0.95	1.01	1.32	0.70	IN	
59	10/22/94	0.84	0.99	1.30	0.68	IN	
60	11/28/94	0.84	0.97	1.29	0.65	IN	

Table 5. Reference Toxicant Summary

CH2M HILL - Milwaukee

Test Type:

Chronic

Organism:

Ceriodaphnia dubia

Age:

< 24 Hours

of Organisms / Conc.:

10

Test Duration:

7 days

Toxicant:

Sodium Chloride

Response:

Mean 7-day % Survival and No. of Young per Adult

Calculation:

NOEC and LOEC

Reporting Period:

November 93 - October 94

		Sun	/ival	Reprod	duction	_
	Test	NOEC	LOEC	NOEC	LOEC	
Test No	<u>Date</u>	(g/L)	(g/L)	(g/L)	(g/L)	Commen
48	11/12/93	2.00	4.00	0.50	1.00	
49	12/3/93	2.00	4.00	0.50	1.00	
50	1/7/94	2.00	4.00	0.50	1.00	
51	2/22/94	2.00	4.00	0.50	1.00	
52	4/5/94	1.00	1.50	1.00	1.50	
53	5/4/94	1.50	2.00	1.00	1.50	
54	5/31/94	2.00	4.00	0.50	1.00	
55	6/18/94	2.00	4.00	0.50	1.00	*
56	7/8/94	2.00	4.00	0.50	1.00	
57	8/4/94	1.50	2.00	0.50	1.00	
58	9/16/94	1.00	1.50	0.50	1.00	
59	10/22/94	2.00	4.00	1.00	1.50	
60	11/28/94	2.00	4.00	0.50	1.00	

Test on 3/29/94 failed acceptability criterion for reproduction; Retest 4/5/94 Test on 5/4/94 for April test requirement

Table 6. Reference Toxicant Summary

Laboratory:

CH2M HILL - Milwaukee

Test Type:

Chronic

Organism:

Pimephales promelas

Age:

< 24 Hours

of Organisms / Conc.:

40

Test Duration:

7 days

Toxicant:

Sodium Chloride

Response:

Mean Growth (mg per number of organisms exposed)

Calculation:

25% Inhibition Concentration (IC25)

Reporting Period:

December 93 - November 94

	Test	IC25	Mean	Mean	Mean	of	
Test No	<u>Date</u>	(g/L)	IC25	+2 S.D.	<u>-2 S.D.</u>	Control	Action if Out of Control
45	12/9/93	0.60	0.55	0.73	0.37	IN	
46	1/11/94	0.33	0.53	0.75	0.32	IN	
47	2/7/94	0.51	0.55	0.71	0.39	IN	
48	3/3/94	0.60	0.56	0.72	0.40	IN	
49	4/12/94	0.40	0.54	0.72	0.36	IN	
50	5/16/94	0.59	0.54	0.72	0.36	IN	
51	6/30/94	0.90	0.57	0.85	0.30	OUT	New lab media used - MHRW as diluent.
52	7/25/94	0.54	0.56	0.84	0.29	IN	
53	8/31/94	0.48	0.55	0.83	0.28	IN	
54	9/28/94	0.61	0.55	0.83	0.28	IN	
55	10/18/94	0.60	0.56	0.84	0.28	IN	
56	11/15/94	0.57	0.56	0.84	0.28	1N	

Table 7. Reference Toxicant Summary

CH2M HILL - Milwaukee

Test Type:

Chronic

Organism:

Pimephales promelas

Age:

< 24 Hours

of Organisms / Conc.:

40

Test Duration:

7 days

Toxicant:

Sodium Chloride

Response:

Mean % 7 day Survival and Growth (mg)

Calculation:

NOEC and LOEC

Reporting Period:

December 93 - November 94

		Survival			Growth	
	Test	NOEC	LOEC	NOEC	C LOEC	
Test No	<u>Date</u>	(g/L)	(g/L)	<u>(g/L)</u>	(g/L)	Comments and Action
45	12/9/93	0.30	1.50	0.30	1.50	
46	1/11/94	0.30	1.50	0.30	1.50	
47	2/7/94	0.30	1.50	0.30	1.50	
48	3/3/94	0.30	1.50	0.30	1.50	
49a	4/12/94	0.30	0.60	0.30	0.60	a: Different dilution series used
50	5/16/94	0.30	1.50	0.30	1.50	
51	6/30/94	1.50	3.00	0.30	1.50	
52	7/25/94	0.30	1.50	0.30	1.50	
53	8/31/94	0.30	1.50	0.30	1.50	
54	9/28/94	0.30	1.50	0.30	1.50	
55	10/18/94	0.30	1.50	0.30	1.50	
56	11/15/94	0.30	1.50	0.30	1.50	